

WHAT IS CLAIMED IS:

1 1. A travel time calculating method of a navigation
2 device, wherein,
3 said navigation device comprises a storage device
4 which stores map data including link data of respective
5 links constituting roads on a map, and statistical data
6 including a travel time or a moving speed, which are
7 determined by statistical values of traffic information
8 collected in the past, wherein,
9 said statistical data is classified by collection
10 condition of the traffic information, which is a basis
11 for determining said statistical data, and
12 the navigation device is allowed to execute the
13 following:
14 a departure position/destination setting step
15 which sets a departure position and a destination,
16 a departure time candidate setting step which sets
17 a plurality of departure time candidates, and
18 a travel time calculating step which uses, with
19 respect to each of said departure time candidates,
20 said map data and
21 said statistical data of the collecting conditions
22 corresponding to statuses in passing through respective
23 route constituting links, each constituting a route
24 between said departure position and said destination,

25 obtains travel times for said respective route
26 constituting links, and
27 further obtains a travel time between said
28 departure position and said destination by summing up
29 thus obtained travel times of respective route
30 constituting links.

1 2. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said statistical data includes a travel time or a
4 moving speed by time zone for each of said links,
5 said travel time calculating step calculates said
6 travel time, by using,
7 as the travel time of a first link constituting a
8 route between said departure position and said
9 destination, a travel time corresponding to a time zone
10 including a departure time of said departure position
11 included in said statistical data, or a travel time
12 obtained from the moving speed corresponding to the
13 time zone, and
14 as the travel time of the (n)th route constituting
15 link ($n \geq 2$) constituting the route between said
16 departure position and said destination, a travel time
17 corresponding to a time zone including an expected
18 arrival point of time at a termination node of (n-1)th
19 route constituting link, being connected to the (n)th

20 route constituting link, or a travel time obtained from
21 a moving speed corresponding to the time zone.

1 3. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said navigation device further executes a route
4 specifying step which specifies a route between said
5 departure position and said destination, and
6 said travel time calculating step obtains, with
7 respect to each of said departure time candidates, a
8 travel time of the route specified in said route
9 specifying step.

1 4. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said navigation device further executes a route
4 searching step which searches for a route between said
5 departure position and said destination, and
6 said travel time calculating step obtains, with
7 respect to each of said departure time candidates, a
8 travel time of the route searched in said route
9 searching step.

1 5. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said travel time calculating step obtains, with

4 respect to each of said departure time candidates, a
5 travel time for a route which has the shortest travel
6 time between said departure position and said
7 destination, which is searched by use of said map data
8 and said statistical data.

1 6. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said navigation device further execute a displaying
4 step, which displays with respect to each of said
5 departure time candidates, the travel time obtained in
6 said travel time calculating step.

1 7. A travel time calculating method of a navigation
2 device according to claim 6, wherein,
3 said statistical data includes a degree of jam by
4 time zone for each of said links,
5 said travel time calculating step uses the travel
6 times of said respective links constituting the travel
7 route or the degree of jam in the time zone
8 corresponding to the moving speed, and determines the
9 degree of jam of each of sections in a case where the
10 travel route is divided into a plurality of sections,
11 and
12 said travel time displaying step displays the
13 travel time and the degree of jam in each of the

14 sections of the travel route obtained in said travel
15 time calculating step, in a length according to the
16 travel time of the section, and in a display mode in
17 accordance with the degree of jam of the section, in a
18 form of bar graph.

1 8. A travel time calculating method of a navigation
2 device according to claim 1, wherein,
3 said departure time candidate setting step includes
4 a step which receives a selection whether the departure
5 time candidate is set to the current time, or to the
6 time beyond the current time.

1 9. A traffic information displaying method of a
2 navigation device, wherein,
3 said navigation device comprises a storage device
4 which stores,
5 map data including link data of respective links
6 constituting roads on a map, statistical data including
7 a travel time or a moving speed which are determined
8 based on statistical values of traffic information
9 collected in the past with respect to each of the links,
10 and
11 information for deciding whether the travel time or
12 the moving speed of each of said links is generated
13 from actual measurement data or is generated from an

14 interpolation processing on the actual measurement data,
15 and
16 when information regarding the travel time or the
17 moving speed of each of said links is displayed based
18 on said statistical data, a display mode is
19 differentiated between the case where the travel time
20 or the moving speed of each of said links is generated
21 from actual measurement data and the case where the
22 travel time or the moving speed of each of said links
23 is generated from the interpolation processing on the
24 actual measurement data.

1 10. A traffic information displaying method of a
2 navigation device according to claim 9, wherein,
3 the information regarding the travel time or the
4 moving speed of each of said links, being generated by
5 the interpolation processing, is not displayed.

1 11. A traffic information displaying method of a
2 navigation device, having a current position detecting
3 function, wherein,
4 said navigation device comprises a storage device
5 which stores,
6 map data including link data of respective links
7 constituting roads on a map, and statistical data
8 including a travel time or a moving speed which are

9 determined based on statistical values of traffic
10 information collected in the past with respect to each
11 of the links, and

12 said navigation device executes:

13 a step which obtains present status traffic
14 information of each of said links present in the
15 periphery of a current position detected by said
16 current position detecting function,

17 a step which receives a selection of a display mode,
18 either of a mode for displaying information based on
19 said statistical data and a mode for displaying
20 information based on said present status traffic
21 information, and

22 a step which displays in the display mode thus
23 selected.

1 12. A traffic information displaying method according
2 to claim 11, further executes,

3 a step which switches the display mode to display
4 the information based on the present status traffic
5 data, when an operation other than an operation to
6 maintain displaying said information based on the
7 statistical data is conducted, while said information
8 based on the statistical data is displayed.

1 13. A navigation device comprising a storing means

2 which stores map data including link data of respective
3 links constituting roads on a map, and statistical data
4 including a travel time or a moving speed, which are
5 determined by statistical values of the traffic
6 information collected in the past, wherein,
7 said statistical data is classified by collection
8 condition of traffic information, which is a basis for
9 determining said statistical data, and the navigation
10 device includes:
11 a departure position/destination setting means
12 which sets a departure position and a destination,
13 a departure time candidate setting means which
14 sets a plurality of departure time candidates, and
15 a travel time calculating means which uses, with
16 respect to each of said departure time candidates,
17 said map data and
18 said statistical data of the collecting conditions
19 corresponding to statuses in passing through respective
20 route constituting links, each constituting a route
21 between said departure position and said destination,
22 obtains travel times for said respective route
23 constituting links, and
24 further obtains a travel time between said
25 departure position and said destination by summing up
26 thus obtained travel times of respective route
27 constituting links.

1 14. A navigation device comprising a storing means
2 which stores,

3 map data including link data of respective links
4 constituting roads on a map, statistical data including
5 a travel time or a moving speed which are determined
6 based on statistical values of traffic information
7 collected in the past with respect to each of the links,
8 and

9 information for deciding whether the travel time or
10 the moving speed of said respective links is generated
11 from actual measurement data or is generated from an
12 interpolation processing on the actual measurement data,
13 and

14 a means which differentiates a display mode between
15 the case where the travel time or the moving speed of
16 each of said links is generated from actual measurement
17 data and the case where the travel time or the moving
18 speed of each of said links is generated from the
19 interpolation processing on the actual measurement data,
20 when information regarding the travel time or the
21 moving speed of each of said links is displayed based
22 on said statistical data.

1 15. A navigation device having a current position
2 detecting function, comprising,

3 a storing means which stores,

4 map data including link data of respective links
5 constituting roads on a map, and statistical data
6 including a travel time or a moving speed which are
7 determined based on statistical values of traffic
8 information collected in the past with respect to each
9 of the links,

10 a means which obtains present status traffic
11 information of each of said links present in the
12 periphery of a current position detected by said
13 current position detecting function,

14 a means which receives a selection of a display mode,
15 either of a mode for displaying information based on
16 said statistical data and a mode for displaying
17 information based on said present status traffic
18 information, and

19 a means which displays in the display mode thus
20 selected.